

of *M. galathea*, averaging about 57 mm. in expanse (females) as against the 50 mm. of the ordinary *M. galathea* v. *procida* from sandstone and schistose formation on the Bosphorus. Kuchuk Chekmejë is a limestone area, seemingly Cretaceous. It was too hot, shade temperature nearly 100°, to do much collecting that day, but on the 29th June I visited the ground again and took a few more of each species in spite of a high wind. On July 20th and 27th, on the ground where I had discovered *Lucina* on April 20th this year, I caught 4 fresh and 2 slightly worn specimens of this species, thus, I think, definitely establishing, at all events, its partial double-broodedness in this area. These second brood specimens of the "Duke of Burgundy" were slightly smaller than those of the first brood. On the 20th July I took a very worn female of *Lampides boeticus*, oddly enough the first time I have caught this ordinarily very common Mediterranean and tropical species near Constantinople. Most insects have been rare if of second broods, or of species emerging in late May, June, or early July, this year; I refer to such things as the second broods of *Celastrina anteros* and *Celastrina argiolus* which latter was for the first time rather uncommon in the Belgrade Forest area in June, and to the Argynnids, except *Dryas pandora*, and Satyrids such as *Pararge roxelana*, *Satyrus circe*, etc. I attribute this scarcity to some three weeks of extraordinarily cold, wet and windy weather, which followed a fine, dry and early spring. *Bithys quercus* did not turn up at all.

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### *Acalla reticulata*, Ström.=*contaminana*, Hüb.—Its History and its Variation.

By H. J. TURNER, F.E.S.

Although many previous references and descriptions by older authors may refer to this species, Hübner is the first author upon whom we can rely with complete certainty as to the identity of the insect indicated by the name *contaminana*, Hb. ("Tort." fig. 142).

The following notes were made from the copy of Hübner's *Saml. Tortrices*, in the Walsingham Library at South Kensington (B.M.).\*

Hübner. *Saml. Tortrices*, figs, 142, 171, 173. [1797.]

Fig. 142 is a good average figure of the common *contaminana* form, but the apex is not produced sufficiently and the hindwings are too dark for an average.

Fig. 171 is larger than the usual British specimens of the *ciliana* form, but as to markings the colour is "off." They are dull brown and certainly have no trace or suggestion of ferruginous. The hindwings of the fig., however, are more nearly correct in being uniformly dirty white or cream than in fig. 142.

Fig. 173 is a light figure of *rhombana* of a deeper brown than fig. 171, with a complete fascia of about uniform width, and a triangular blotch on the costa, the remains of the other arm of the Y in *contaminana*. There is no basis of ferruginous as there is in all the numerous specimens referable to *rhombana* which I have seen. Nor is there any suffusion of the very dark fuscous except that the fascia and

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\* In dealing with these old hand-coloured books it is necessary to specify the particular copy, as the copies, often coloured to order subsequent to the original issue, vary *inter se*, and due allowance must also be made for age deterioration. blotch are of that colour. The hindwings are as dark as in fig. 142,

with a much darker wide marginal cloud. The shape of the forewing is much too pointed, in fact not at all comparable to the real shape of the species. I would even call it malformed. If this be a *contaminana* form, then the very dark practically uniform specimens are worthy of a varietal name without a doubt.

*Phalaena obscurana*. Donovan. *Nat. Hist. Br. Ins.*, vol. xi., p. 40, pl. 374, fig. 2. [1804.]

"*Tortrix obscurana*. Anterior wings somewhat ferruginous, obscurely clouded and speckled with fuscous; posterior wings pale."

The figure (nat. size) and the enlargement do not agree. The former has no speckles and no cloud nor fascia, only an indistinct smudge in the disc, and a small dark triangular spot where the basal transverse line should begin on the costa. The colour is considerably more than "somewhat" ferruginous in both figures. The veins are well marked in the marginal area, but there are no reticulations marked. The cloud on the enlarged figure is in no way like the marking I have seen in any of the specimens I have examined.

Inspection of the figure justifies one in identifying it as *ciliana*, Hüb., hence the name *obscurana*, Don., must be considered a synonym of *ciliana*, Hüb.

The first description of *contaminana* subsequent to Hb. is that of Haworth as follows:—

Haworth. *Lep. Brit.*, p. 419, no. 80. [1812 (11).] *Tortrix contaminana*.

"T. alis acutis stramineis, rufo pulcherrime reticulatis, costa basi, fasciaque media sinuosa bifida ustulatis.

"*Tort. contaminana*, Hüb. Tort. 142. Ph. *Pyralis xylostean*a (Haw), *Prod. Lep. Brit.*, 32. [1802.]

"Descriptio. "Simillima praecedentibus (*ciliana*, no. 79) ut distincta, nempe vix unquam variat: sed solum differt ab ultima, fasciâ mediâ anticarum alarum, quae maxima est, et ad costam grosse seu ineleganter bifida.

"β. Macula straminea in postica parte fasciae anticarum alarum.

"Obs. In English cabinets this species is frequently named *xylostean*a."

Haworth. *Lep. Brit.*, p. 419, no. 79. [1812 (11).] *Tortrix ciliana*. Hüb. Tort., 171.=Ph. *obscurana*, Don. xi., 374.

"T. alis acutis ferrugineis, fusco rufove reticulatis, fascia mediâ abbreviata obliqua costali saturatiore."

"Descriptio. Praecedenti (*rhombana*) nimis affinis et forte varietas, sed differt in fasciâ mediâ abbreviata, nec completa usque ad marginem tenuiorem. Etiam variat.

"α. Alis anticis laete ferrugineis, lente paululum reticulatis fasciâ obscurâ obliquâ brevissimâ parum saturatiore medio marginis crassioris; margine ipso postico tenue ustulato: posticis albidis, seu pallidis fuscescentibus, ciliisque omnibus albis.

"β. Alis anticis saturatioribus, sive sordide testaceis, ustulato conspicuè reticulatis: cacteris ut in α.

"γ. Duplo major, alis anticis pallide testaceis, rufo sordidè ut conspicuè reticulatis caeteris ut in α.

"δ. Statura α, vel subinde duplo major alis anticis pallidissime

testaceis, sive stramineis, absque fasciâ, sed omnino rufo pulcherrime reticulatis."

This is the first description of the *ciliana* form subsequent to Donovan's very short inadequate explanation of his figure.

Haworth. *Lep. Brit.*, pp. 418, no. 78. [1812 (11).] *Tortrix rhombana*. Hb. 173.

"Alis acutis ferrugineis subreticulatis fascia completa sinuosa media nigricante."

"Descriptio. T. bifidanae similis sed dignoscitur primo intuitu, alis anticis apice acutis, nec obtusis, sive retusis."

Variat.

"a. Alis anticis saturate ferrugineis, obsolete fusco reticulatis, strigâ obsoletâ ante medium; fasciâque mediâ sinuosâ vix obliquâ completâ ustulato-fuscis; et inter hanc fasciam et marginem posticum, maculâ costali etiam ustulato-fuscâ; posticis pallide fusciscentibus, vel albicantibus; ciliis omnibus albis, sed in anticis alis, ad angulum ani ustulatis.

"β. Fere duplo minor, alis anticis magis ferrugineis; caeteris ut in a.

"γ. Anticis pone fasciam mediam, maculis duabus fusco-ustulatis, una costali, altera opposita disci: caeteris ut in β.

"δ. Alis anticis sordide ferrugineis fusco plus minus suffusis, fasciis maculisque obsoletis; caeteris ut in ultimis.

"e. Alis anticis omnino fuscis, immaculatis, costa ipsa solum tenuissime ferruginea: caeteris ut in δ.

"f. Alis, ciliis, costaque ipsa omnino fuscis immaculatis: caeteris ut in ultimis."

In the above description (the original description) Haworth says "T. bifidanae similis." Subsequent authors recognise *bifidana*, Haw., as *ferrugana*.

In the above three descriptions and the varieties shortly diagnosed Haworth gives a very fair summary of the aberration usually met with in this species. But it must be noted that this is not the *rhombana*, Hb. 173.

In [1821] Charpentier, with Notes by the talented Zincken g. Sommer, revised the micro-lepidopterous portion of the famous *Verz. Wien.* of Schiffermüller in his *Zun. Wick. Schab. etc., Verz. Wien.*, with the actual collection of the latter before him.

A. Charpentier (Zincken). *Zun. Wick. Schab., etc., Verz. Wien.*, p. 47. [1821.]

"Schiff. W.V., p. 128, no. 10. *Tort. rosana* = *Tort. contaminana*, Hub., 142.

He says:—"I feel quite sure that Linné's *Tortrix rosana*, *Sys. Nat.*, xii., p. 876, and *Fn. Suec.*, no. 1314, belongs here, it cannot be put to *T. sorbiana*, Hüb., as Lespeyres does in Illiger's Magazine. The 'Fauna' describes this *Tortrix* quite recognisably, especially the words at the end: 'alae superiores postice emarginatae, margine nigricante.' The shape of Hübner's figure of this *Tortrix*, which I possess in considerable variety, is not quite true to nature."

Charpentier does not consider the whole description which, as Zincken points out below, is quite exclusive of *contaminana*. Linné has confused the species in x. when editing xii.

Note by Zincken g. Som: "Hübner's *T. contaminana* is in no way the *T. rosana*, Linn. In the former the forewings are 'pallidae ferrugineo reticulatae,' the hindwings 'niveo sericeae,' but Linné says 'alae omnes griseae seu dilute testaceae, tam supra quam infra.' This description is also given to *T. sorbiana* in which the forewings are (schalten) blackish shade, black below, the hindwings black gray (fuscae) above. To no Tortrix does the description fit better and more generally than to the female of the Tortrix *pyrustrana* (!). Further there is no figure of this known to me, to which I can refer, and Hübner has only depicted the male (fig. 124), which is quite different from the female. Therefore Linne's description of the figure is distinctly sufficient for the general appearance if only one considers the words 'fascia obliqua' not too rigidly, but as two rusty-brown lines in which the intermediate space is somewhat darker only towards the innermargin."

Linné's description may have been from one of the forms of *contaminana*. Zincken's criticism appears well grounded.

B. Charpentier (Zincken). *Zum. Wick. Schab., etc., Verz. Wien.*, p. 48. [1821.]

"Schiff. *W.V.*, p. 128, no. 11. *Tort. americana* = *Tort. contaminana*, Hüb.

"Here in Schiffermüller's collection is found a very worn pale example of *T. rosana* = *contaminana*, Hüb. It is just like a pale variety in which there is not even a slight trace of the obscure spot on the margin.

"Whether Linné's *americana* is possibly only a similar variety is not ascertainable. He says in the 'Fauna' under no. 1310 (where *amerina* stands for *americana*, but which in the *Sys. Nat.* (xii.—H.J.T.) is cited with the use of the same diagnosis under the no. 1310 as *ameriana*) 'Simillima rosanae.' But the words 'litura communis ferruginea' appear to betoken another species.

"Fig. 6 and 7 in *Reaumur*, vol. ii., pl. 18, which Linné cites, is quite unrecognisable, even in the quarto edition. So also are the figures 5, 6, 7, 8 and 9 of plate 15 of vol. ii., of which Fabricius remarks: 'These probably depict several species.'" These remarks are quite justified.

Zincken g. Sommer remarks: "The *T. amerina*, Linn., I believe I recognise in Hübs. fig. 124, ♂ *T. pyrustrana*. The words 'simillima rosanae—alae refusae—litura communi ferruginea' leave it as very conjectural. I must here note that the 'litura communis ferruginea' which extend not far from the bend of the inner margin somewhat obliquely to the middle of the wing area, in Hübner's figure run quite up to the costa, and here form with the 'litura' a 'fascia' or 'striga' which never occurs thus in this Tortrix."

C. Charpentier (Zincken). *Zum. Wick. Schab., etc., Verz. Wien.*, p. 59. [1821.]

"Schiff. *W.V.*, p. 128, no 7. *T. rhombana* = *T. rhombana*, Hüb., 173."

It will be seen from the examination of the various works to which we have referred that the *T. rosana* of Linné, *S.N.*, x., *Fn. S.* and *S.N.*, xii., may or may not refer to the species which Hübner subsequently called *contaminana*. While in *S.N.*, x., and *S.N.*, xii.,



the descriptions are too meagre and cover several species readily, that in *Fn. S.* is prolix and may possibly refer to one of the darker forms of *contaminana*, although the remarks of Zincken preclude even this suggestion. The reference of Linné to *Mad. Merian's Eur.*, i., is of no avail, as the figures are quite unrecognisable. The remarks as to *sorbiana* and *pyru(a)strana* all rest on "may-be."

Exactly similar remarks apply to the *T. americana* of Linné, *S.N.*, x., *Fn. S.*, and *S.N.*, xii., and the figures in both *Merian, Eur.*, i., and *Reaumur, Mem.*, ii., are equally unrecognisable as to specific identity.

It will also be seen that *Fabricius, Sp. Ins.*, iii., and *Ent. Sys. auct.*, iii. (?) adds no further evidence.

The extreme variation in *contaminana* and the paucity of material which Linné had access to (probably at most only two or three specimens) leaves it quite possible that both *rosana*, L., and *americana*, L., were forms of *contaminana*, Hüb.

The statement and fact upon which we are justified in relying so far, are that the specimens in *Schiffermüller's* collection labelled *rosana* and *americana* were actually specimens of *contaminana*, and this identification was confirmed much later by the identification of *Herrich-Schäffer*, who also saw the identical specimens of the "W.V." collection.

*Herrich-Schäffer, Sys. Bearb.*, vol. iv., p. 153 [1849], says:—"The *W.V.*, p. 128, *rosana*, dog-rose Tortrix, is this species. There are two specimens in the collection, one unset, yellow with somewhat obliterated dark brown band, and one set, very bright yellow with very dark brown band.

"The *W.V.*, p. 128, *americana*, the sawfly Tortrix. A good pale yellow specimen, in place of the band it has only a reddish-brown three cornered spot on the costa. Both species (*rosana* and *americana*) *Charpentier* considers as *contaminana*, Hüb., 142, and *Treitschke* also refers *ciliana*, Hüb., 171, as a variety of it. They are indeed rightly *contaminana*, Hüb., 142."

If we could directly connect and identify the *rosana*, W.V. (1776), and the *americana*, W.V. (1776), with the Linné descriptions (1758, -61, -67) we should have, according to the rule of priority, to allow the name *contaminana* to fall, unless stronger evidence pointed to another species included in the generality of Linné's description. Thus, after very careful comparison and investigation of all references, figures, descriptions, reviews, opinions, etc., it has been possible to collect, no further evidence is forthcoming, and it seems practically impossible to identify, with any degree of certainty, any of these early descriptions with the insect so long called *contaminana*, Hb.

There are, however, other of the older descriptions and names which may with some degree of certainty apply here, one of which is the insect figured by *De Geer*, and referred to as—

"*Phalaena Pallium reticulatum.*" *Retzius. De Geer (Lister). Gen. Sp. Ins.*, p. 51. [1783].

"*Spirilinguis antennis filiformibus, alis rhombeis fuscis maculis strigisque obscuris: inferioribus supra nigrescentibus, palpis recurvis.*" (*T. 2*, p. 468. *T. 1*, p. 403, t. 27, f. 1-8, 11-14) (*L.S.N.* 876).

*Mr. Sich's* remarks (*in lit.*), "*De Geer's P. reticulatum* seems to me

to be out of the running on account of its '*palpis recurvis*,' conclusively dispose of this reference.

Another description is that of Ström, *Nye Saml. k. Danske Vid. Selsk. Skrift.*, p. 86, sp. 120 [1783], who described a Tortrix under the name *reticulata*. After considerable trouble owing to the reference being insufficient, and with the kind assistance of my colleague Mr. J. H. Durrant of the Brit. Mus., I have found the description referred to and also a translation from the original Norwegian by Herr Schøyen in *Stett. e. Z.* [1880], 41, p. 135, which I here append.

"Phalaena tortrix (*reticulata*) alis flavo-ferrugineis, reticulatis, macula marginali curva fusca. Sie ist etwas kleiner (als die nächst vorige, *Tortrix maculata* benannte Art) vorn breiter als gewöhnlich, von gelbrauner Farbe an den Vorderflügeln, die viele braune Linien längs und quer haben und am äusseren Rande, gerade in der Mitte, einen dunkelbraunen Fleck wie einen Winkelhaken, dessen unterster Zweig jedoch ganz fein und wenig kenntlich ist, jenen breiten gegenüber. Die Hinterflügeln sind weisslich, ebenso wie der Leib und die Beine. Sie gleicht der *Phalaena tortrix moderiana*."

*Ph. tort. moderiana* has been identified as *ferrugana*.

Schøyen states that this determination necessitates the replacement of *contaminana*, Hb., by Ström's prior name *reticulata*. This determination took place 40 years ago, and was adopted by the great Scandinavian entomologist Wallengren, who, *Christ. Vid. Forhand.*, no. 2, p. 18 [1880]; *Ent. Tidsk.*, ix. 172 (Dan. Scand. Lap. Norv.) [1888], also critically examined Ström's descriptions. J. H. Durrant, Kennel, and others all agree in this determination, and Staudinger inserts it with a ?

Still another old description possibly relates to this species, viz., that of

*Tortrix centrana*, Fab. *Ent. Sys. auct.*, vol. iii., pt. 2, 273. [1794.]

"*Alis flavis: litura media cruciformi fusca. Habitat Parisiis Dom. Bosc.*

"*Magnitudo et statura P. forskalhianae. Caput et thorax flavescentia. Alae anticae flavae litura magna, media, cruciformi, fusca. Posticis albidae.*"

Mr. Sich also disposes of this reference. "With regard to *centrana*, Fb., if of the same size as *forskalhiana* it would be too small for *contaminana*." (*in litt.*)

Two other early references are added.

Harris. *Pock. Comp.*, p. 49, no. 342. [1775.]

"Yellow brown with three broad brown bars."

Possibly refers to *ciliana*, as Stephen's *Cat.* says.

Harris. *Exposition*, p. 94, pl. 28, fig. 2, 3 (enlarged). [1782.]

No name.

A quite recognisable figure as to reticulation and fascia of the *contaminana* form, the colour of course is weak.

Fabricius. *Ent. Sys. auct. Supp.* [1798], p. 479. *Tortrix reticulana*.

*P. alis flavis fusco strigosis arcuque magno costali fusco.*"

"*Magna. Corpus cinereum. Alae anticae flavae strigis numerosis, fuscis et in medio costae macula magna fusca in cuius medio macula costalis flava. Posticae cinerae.*"

Froelich, in 1828, refers to this with reserve, and we can well at this distant date let the reference fall as indeterminate, especially as no references to figures or descriptions are given by Fabricius.

In [1826] in his *Verz.*, Hübner summarises as follows under 3 different Genera.

"*Aleimma contaminana*. Hüb. *Verz.*, p. 392. (Hüb., *Zutr. Tort.*, 142)"

"*Amelia rhombana*. Hüb. *Verz.*, p. 390. (Schiff. *WT.*; *Tort.* D.7; Hüb. *Tort.* 173.)

"*Acalla ciliana*. Hüb. *Verz.*, p. 383. (Hüb. *Tort.* 171.)

Of these three genera since *Acalla* was the earliest, and since the three Hübnerian species are forms of the same species, *Acalla* is the generic name which has been adopted for *contaminana* in Staudinger's *Catalog* (following Meyrick). But this is another question. Meyrick adopted *Acalla*, but subsequently dropped it without comment in Wyttsmann's *Gen. Ins.* and *Lep. Cat.* for the name *Peronea* of Curtis, which in turn may probably have to fall before *Oxygrapha*, Hüb. *Verz.*

Froelich. *Enumeratio Tort. Wurt.*, p. 26 [1828], points out the raised scales on the wings, etc., and describes and names a new (?) form as *T. dimidiana*.

"No. 26. *T. contaminana* alis anticis retuso-apiculatis pallide flavicantibus rufo-reticulatis; macula costali fusca, puncto disci niveo, fimbria alisque posticis albis.

Hüb., 142. *Charp.*, p. 47. *Fabr. Sup.*, p. 379. *Pyr. reticulana* (?).

"*L. frequens* Elvaci in *Pyro sylvestris*. July, August.

"*Colore multum variat*. Alae anticae jam dilute luteolae jam luteo-testacea fusco aut rufo-reticulatae. Macula costalis major minorve, aut rufa aut fusca saepe fasciae-formis marginem internum attingit ad costam interrupta, rarissima nulla. In disco semper punctum niveum e squamis elevatis adest, facile obliterandum."

"No. 27. *T. dimidiana* alis anticis retuso-apiculatis brunneo-fuscis immaculatis: puncto disci fimbriaque dimidiato niveis, posticis fusco-cinereis.

"*L. rarius* in sepibus. October.

"*Habitus et summa affinitas antecedentis (contaminana)*, et forsan varietas ejusdem; at serior apparet nec frequens. Figura alarum omnino eadem; anticae fusco brunneae immaculatae, raro strigulis flammeo brunneis, et puncto niveo discoidali elevato notatae, posticae obscuriores cinereae, nec albae. Caput et thorax obscure ferruginea."

Hübner. *Tort.*, figs. 299, 300. [1829 or 30.]

Figs. 299 and 300 are quite the same except that the general coloration differs. In 299 it is of a rich very deep fuscous brown perhaps intended as a reference to the ferruginous basis in many forms (*ciliana*). The hindwings are also of a corresponding grade of colour. In 300 it is of a fuscous black and the hindwings are of a corresponding grade of colour. The dark shading in both figures are exactly the same in area and shape. These areas are the basal, outer marginal, and a blotch on the costa connected by a costal darkening. Hübner calls these figures *dimidiana*. They are certainly not the *rhombana* of Hüb. 173.

(To be concluded.)